

REMARKS

Applicants appreciate the Examiner's thorough examination of the present application as evidenced by the Office Action of November 28, 2005 (hereinafter "Office Action"). Applicants especially appreciate the allowance of Claims 27, 30, 41, 44, and 49. In response, Applicants respectfully submit that the cited references do not disclose or suggest, at least, the recitations of the pending independent claims. Accordingly, Applicants submit that all pending claims are in condition for allowance. Favorable reconsideration of all pending claims is respectfully requested for at least the reasons discussed hereafter.

Independent Claims 1, 9, 19, and 33 are Patentable

Independent Claim 1 stands rejected under 35 U.S.C. §103(a) as being obvious over U. S. Patent No. 6,597,927 to Eswara et al. (hereinafter "Eswara") in view of U. S. Patent No. 6,011,786 to Dent (hereinafter "Dent"). Independent Claims 9 and 19 stand rejected under 35 U.S.C. §103(a) as being obvious over Eswara in view of U. S. Patent No. 6,298,081 to Almgren et al. (hereinafter "Almgren") and Dent. Independent Claim 33 stands rejected under 35 U.S.C. §103(a) as being obvious over Eswara in view of Almgren, Dent, and U. S. Patent No. 6,256,486 to Barany et al. (hereinafter "Barany").

Independent Claim 1 is directed to a cellular communication system and has been amended to clarify that the at least one idle time slot is a defined idle time slot. Claim 1 now recites, in part:

a cell group that comprises a plurality of cells that are respectively associated with the plurality of base station transceivers and with a plurality of primary frequencies, such that in each of the plurality of cells the respectively associated base station transceiver uses the respectively associated primary frequency to communicate control information, communication of the control information being constrained to the respectively associated primary frequency, and uses coordinated frequency hopping based on a hopping sequence over the plurality of primary frequencies to communicate traffic information;

wherein each of the plurality of cells has predefined control time slots associated therewith that are used to communicate the control information and has predefined traffic time slots associated therewith that are used to communicate the traffic information and **at least one defined idle time slot**

separates at least one of the predefined control time slots from at least one of the predefined traffic time slots, which are associated with different primary frequencies. (Emphasis added).

Claims 9, 19, and 33 include similar recitations. According to the recitations highlighted above, one or more control time slots are separated from one or more traffic time slots by at least one defined idle time slot. Moreover, the control time slot(s) and traffic time slot(s) are associated with different frequencies. This is illustrated, for example, in FIG. 8D of the Specification where an idle time slot (represented as a blank entry in the table) is inserted between time slots associated with different frequencies.

In rejecting independent Claims 1, 9, 19, and 33, the Office Action acknowledges that Eswara does not disclose or suggest that one or more idle time slots separate one or more control time slots from one or more traffic time slots that are associated with different frequencies. (June 2, 2005 Office Action, pages 3, 8, and 18). The June 2, 2005 Office Action alleges, however, that FIGS. 5 and FIGS. 8A through 8C of Dent provide the missing teaching. Applicants respectfully disagree with this interpretation of the teachings of Dent. Turning first to FIG. 5, this figure illustrates the use of control channels in a wireless communication system. The time slots surrounding the control channel time slots are left blank because the purpose of this figure is to illustrate the use of control channels for associated cells (see, e.g., Dent, col. 8, lines 13 - 47). Moreover, FIG. 5 of Dent describes control and traffic channels for a single frequency f_v . According to the independent Claims 1, 9, 19, and 33, one or more predefined control time slots are separated from one or more predefined traffic time slots by one or more defined idle time slots and the control time slot(s) and traffic time slot(s) are associated with different frequencies.

Turning to FIGS. 8A through 8C, Dent provides more detail with respect to the use of the time slots that are not used for the control channel for a particular cell. Referring now to FIG. 8A of Dent, for cell/sector i , time slot t_i on frequency f_i is used for the control channel C_i . The remaining time slots used in sector i are assigned to traffic or, if not used for traffic, are used to communicate the control channels for adjacent cells j and/or k . (Dent, col. 10, lines 61 - 65). The Office Action points out that Dent uses permissive language in that an idle traffic channel may be used to communicate control channels at col. 10, lines 64 and 65.

Nowhere in FIGS. 8A through 8C or in the accompanying text does Dent illustrate, describe, or suggest inserting a defined idle time slot between a control time slot on a first frequency and a traffic time slot on a second frequency, different from the first frequency as recited in independent Claims 1, 9, 19, and 33. In fact, Dent describes the time slots not assigned to traffic or a control channel as being "unassigned to a traffic channel" or "assigned to a traffic channel which is idle." (Dent, col. 10, lines 63 and 64). Thus, according to Dent, the time slots are either assigned to a traffic channel or currently unassigned to a traffic channel, but available for transmission of a control channel from a neighboring cell. Nowhere does Dent define or reserve time slots as being idle.

Accordingly, for at least the foregoing reasons, Applicants respectfully submit that independent Claims 1, 9, 19, and 33 are patentable over Eswara, Dent, Almgren, and Barany, and that Claims 2, 3, 5 - 8, 11, 12, 14- 18, 21, 22, 24, 25, 28, 29, 31, 32, 35, 36, 38, 39, 42, 43, 45, 46 are patentable at least as they depend from an allowable claim.

Independent Claim 48 is Patentable

Independent Claim 48 stands rejected under 35 U.S.C. §103(a) as being obvious over Eswara in view of Almgren. Independent 48 recites, in part:

a base station subsystem; and
a mobile terminal that is configured to use a control frequency to exchange control information between the mobile terminal and the base station subsystem, the exchange of control information being constrained to the control frequency, and is configured to use coordinated frequency hopping based on a hopping sequence over a plurality of traffic frequencies to exchange traffic information between the mobile terminal and the base station subsystem;

wherein frequencies associated with an auxiliary cellular communication system coexist within a same bandwidth defined by the plurality of traffic frequencies. (Emphasis added).

According to Claim 48, the frequencies within the auxiliary cellular communication system coexist within a same bandwidth defined by the plurality of traffic frequencies. In rejecting Claim 6, the June 2, 2005 Office Action alleges that Eswara discloses an auxiliary cellular communication system that coexists within a same bandwidth defined by a plurality of

primary frequencies in FIG. 4. Applicants respectfully disagree with this interpretation of Eswara's teachings. With reference to FIG. 3, Eswara explains that the four beams A, B, C, and D shown in FIG. 4 "would have an assigned set of traffic frequencies for use by MSs and a control frequency for assigning traffic frequencies." (Eswara, col. 3, lines 45 - 48). The Office Action alleges that the beams overlap in FIG. 4 and therefore coexist within a same bandwidth. (Office Action, page 3). Applicants respectfully disagree. The overlap shown in FIG. 4 is merely a physical overlap of the signals transmitted by the narrow beam antennas. (Eswara, col. 3, lines 41 - 43 and 55 - 57). Applicants can find no disclosure or suggestion in Eswara indicating that one or more frequencies used in one of the beams A, B, C, or D may be within the bandwidth defined by frequencies used in another one of the beams A, B, C, or D. That is, there is no indication in Eswara that a frequency used in beam A is used in any of the other beams B, C, or D, for example. Moreover, Almgren fails to provide the missing teaching.

Accordingly, for at least the foregoing reasons, Applicants respectfully submit that independent Claim 48 is patentable over Eswara in view of Almgren.

Independent Claim 50 is Patentable

Independent Claim 50 stands rejected under 35 U.S.C. §103(a) as being obvious over Barany in view of U. S. Patent No. 5,828,693 to Mays et al. (hereinafter "Mays").

Independent Claim 50 recites, in part:

assigning a control frequency to a cell in which the mobile terminal is located;

using the control frequency to exchange control information between the mobile terminal and the base station subsystem, the exchange of control information being constrained to the control frequency;

assigning a plurality of traffic frequencies to the cell in which the mobile terminal is located, each of the plurality of traffic frequencies being associated with an equivalence class of frequencies;

randomly selecting a frequency from each of the plurality of equivalence classes of frequencies; and

using the randomly selected frequencies to communicate traffic information between the mobile terminal and the base station subsystem.
(Emphasis added).

Applicants respectfully submit that Barany does not disclose or suggest, at least, the highlighted recitations above. That is, Barany does not disclose or suggest using randomly selected frequencies from each of a plurality of equivalence classes of frequencies to communicate. The Office Action alleges that Barany discloses randomly selecting a frequency from each of the plurality of equivalence classes of frequencies at col. 14, lines 55 - 56. This passage of Barany cited in the Office Action refers to the use of a packet random access channel (PRACH) for uplink communications. Applicants respectfully disagree, however, that the use of a PRACH discloses randomly selecting a frequency from each of the plurality of equivalence classes of frequencies as recited in Claim 50. In the art of radio access protocols, a PRACH is used to address the problem of how to share a common broadcast channel. Thus, the term "random" when used with respect to a random access channel means that there is no predictable or scheduled time for a mobile station to transmit. In response, the Office Action states that Applicants have not claimed predictability. (Office Action, page 3). Applicants agree that they are not claiming predictability. Applicants in fact are claiming that a frequency from each of a plurality of equivalence classes of frequencies is selected at random. The PRACH operates by the transmit time being random, not the frequency used being random as recited in independent Claim 50. Applicants submit that use of a PRACH has nothing to do with randomly selecting a frequency from each of a plurality of equivalence classes of frequencies and using the randomly selected frequencies to communicate traffic information between a mobile terminal and a base station subsystem. Applicants further submit that Mays fails to provide the missing teachings as this reference is cited merely for the proposition that a frequency can be selected at random from a subset of frequencies. (Mays, col. 12, lines 60 - 64), but does not contain any teaching with respect to what the subset of frequencies might be. As recited in independent Claim 50, a plurality of traffic frequencies are assigned to a cell and each of the plurality of frequencies is associated with an equivalence class of frequencies. A frequency from each of the equivalence classes is selected and used to communicate traffic information. Mays does not contain any disclosure that the subset or sub-range of frequencies described therein corresponds to one of multiple equivalence classes of frequencies that are defined based on an initial assignment of multiple frequencies to a cell as recited in independent Claim 50.

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Accordingly, for at least the foregoing reasons, Applicants respectfully submit that independent Claim 50 is patentable over Barany and Mays.

CONCLUSION

In light of the above amendments and remarks, Applicants respectfully submit that the above-entitled application is now in condition for allowance. Favorable reconsideration of this application, as amended, is respectfully requested. Alternatively, Applicants respectfully request entry of the present amendment as introducing no new issues and narrowing the issues for further consideration. If, in the opinion of the Examiner, a telephonic conference would expedite the examination of this matter, the Examiner is invited to call the undersigned attorney at (919) 854-1400.

Respectfully submitted



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